Saskatchewan
Energy and Mines

Saskatchewan
Geological Survey

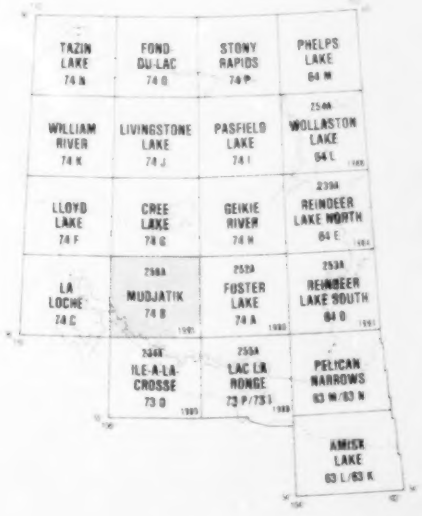
Report 256

**Metallogenic Map Series:**

# Mudjatik, NTS Area 74B

First Edition, 1991

compiled by Blaine P. Scott


TAZIN LAKE 74 N
FOND-DU-LAC 74 O
STONY RAPIDS 74 P
PHELPS LAKE 64 M
WILLIAM RIVER 74 K
LIVINGSTONE LAKE 74 J
PASFIELD LAKE 74 I
WOLLASTON LAKE 64 L
LLOYD LAKE 74 F
CREE LAKE 74 G
GEIKIE RIVER 74 H
REINDEER LAKE NORTH 64 E
LA LOCHE 74 C
MUDJATIK 74 B
FOSTER LAKE 74 A
REINDEER LAKE SOUTH 64 D
ILE-A-LA-CROSSE 73 O
LAC LA RONGE 73 P/73 I
PELICAN NARROWS 63 M/63 N
AMISK LAKE 63 L/63 K

Saskatchewan
Energy and Mines

Saskatchewan
Geological Survey

Report 256

**Metallogenic Map Series:**

# Mudjatik, NTS Area 74B

First Edition, 1991

compiled by Blaine P. Scott

Printed under the authority of the
Minister of Energy and Mines

Although the Department of Energy and Mines has exercised all reasonable care in the compilation, interpretation and production of this report, it is not possible to ensure total accuracy, and all persons who rely on the information contained herein do so at their own risk. The Department of Energy and Mines and the Government of Saskatchewan do not accept liability for any errors, omissions or inaccuracies that may be included in, or derived from, this report.

Parts of this report may be quoted if credit is given. It is recommended that reference to this report be made as follows:

Scott, B.P. (1991): Metallogenic Map Series, Mudjatik, NTS Area 74B; Sask. Energy Mines, Rep. 256, 14p (accompanied by 1:250 000 scale map).

Manuscript received June, 1991
Reviewed and edited by
T.I.I. Sibbald, D.G. MacDougall and C.T. Harper

Prepared for release by
C.L. Brown and N. Richmond-Johnson

Released November 1991
Mineral Development Branch

93-00457/

# Contents

Page

Metallogenic Notes ..... 1
1. Gold Mineralization ..... 1
2. Silver Mineralization ..... 1
3. Copper Mineralization ..... 1
4. Iron Mineralization ..... 1
5. Uranium ± Molybdenum Mineralization ..... 2
6. Lead Mineralization ..... 2
7. Miscellaneous Occurrences of Mineralization ..... 2

References ..... 3

Mineral Occurrences ..... 7

Map 256A ..... in pocket

# Metallogenic Notes

The main types of mineralization in the Mudjatik Area are:

1) Gold, in foliation-parallel quartz vein systems and in mafic granulites. Gold is also found with pyrite, pyrrhotite and chalcopyrite in iron formation.

2) Silver associated with pyrite, pyrrhotite and arsenopyrite and traces of gold, in iron formation, metasediments and metavolcanics.

3) Chalcopyrite, in calc-silicate rock and native copper with disseminated pyrite and pyrrhotite in banded iron formation.

4) Sulphide-silicate-oxide facies iron formation.

5) Uraninite ± molybdenite, as disseminations in granite, granite-pegmatite, calc-silicate rock and quartzofeldspathic gneiss.

6) Galena, in feldspathic quartzite and lead values associated with uranium mineralization.

7) Miscellaneous occurrences, including low grade zinc and nickel values in metasediments, REE in granite pegmatite and asbestos in serpentinite.

## 1. Gold Mineralization

At Ithingo Lake, gold mineralization occurs in an east-trending, steep northerly-dipping, foliation-parallel quartz-filled shear in gneissose amphibolite and hornblende pyroxene granulite (interpreted as mafic metavolcanics) along the southern rim of the northern basin of the lake (SMDI 2074). Quartz veins in the shear have been isoclinally folded, boudinaged, and metamorphosed, indicating that mineralization predates the major deformation and peak metamorphism. Disseminated pyrite, pyrrhotite and arsenopyrite are sparsely present in the veins and in the structural hanging wall, which in contrast to the footwall rocks, shows strong iron staining. The mineralized zone, which has been traced for about 340 m (63, 64, 65, 66) is located within two metres of a quartzofeldspathic gneiss unit possibly representing felsic metavolcanics. Thin layers of silicate facies iron formation, up to 30 cm thick, comprising coarse-grained garnet, hornblende, diopside, quartz and magnetite also occur close to the mineralized zone, but their relationship to the gold mineralization is uncertain. It is believed that mineralization, similar to that of many other greenstone hosted lode gold deposits (44), is structurally-controlled. Diamond drilling of the main zone at Ithingo Lake returned an average grade of 2.4 g/t (0.07 oz/ton) Au across a true width of 6.1 m (65).

Low grade assays in gold, silver and copper have been returned from easterly-trending sulphide and silicate facies iron formation in the Peter, Centipede, Segment and Three Phase Lakes area.

## 2. Silver Mineralization

Low grade silver mineralization containing traces of gold, native copper and molybdenite occurs near the east end of Centipede Lake, where trenching gave assays as high as 16.5 g/t (0.48 oz/ton) Ag and 0.7 g/t (0.02 oz/ton) Au (SMDI 1042). The area is underlain by iron formation and metavolcanics and intruded by ultramafic bodies. A similar showing near Blackstone Lake (SMDI 1041), hosted by metavolcanics and banded iron formation, assayed 13.7 g/t (0.40 oz/ton) Ag and a trace of Au. Ten kilometres west of Vermilion Lake, a quartzite containing disseminated crystals of pyrite and arsenopyrite (SMDI 1079) yielded assays between 5.5 g/t (0.16 oz/ton) and 8.9 g/t (0.26 oz/ton) Ag, and near the southwest bay of this lake, a radioactive metasedimentary unit was found to contain 13.0 g/t (0.38 oz/ton) Ag and a trace of Au (SMDI 1085).

## 3. Copper Mineralization

Low grade copper mineralization occurs in hornblende gabbro, hornblendite and along contacts with quartzite units in an easterly-trending belt between Porter Lake and the northeast bay of Segment Lake (SMDI 1045). Chalcopyrite is present with disseminated pyrite and pyrrhotite and also with native copper.

Chalcopyrite has also been recognized in psammite (SMDI 1058), and in biotite-rich gneiss, calc-silicate rock and granitic gneiss (SMDI 1059). Low copper values have also been obtained from a variety of calcareous and/or hornblendic metasediments (SMDI 1065, 1024a and 1024b).

## 4. Iron Mineralization

Banded quartz-magnetite iron formation is the principal type of iron mineralization found in the area. Units, which range from 10 to 300 m thick, can be traced for up to 30 km along strike. Oxide facies (magnetite) iron formation predominates, sulphide (pyrite, pyrrhotite, minor chalcopyrite) and silicate (amphibole, garnet, biotite, olivine, pyroxene) facies and/or mixtures of the three occur locally with ubiquitous quartz. Discrete magnetite-rich layers are generally less than 3 cm thick, and alternate with siliceous layers of equal or greater thickness; however, a spectacular 3 m thick band of massive magnetite outcrops on the west side of a small lake midway between Splash and Porter Lakes (43; east of SMDI 1052). The iron formations are classed as transitional between Algoma- and Superior-types and are thought to have been deposited in a transitional platform- to rift-phase tectonic setting (42, 43).

Although ore grade concentrations (>30 percent soluble Fe) have been obtained at a few locations (e.g. southwest of Dot Lake (42), SMDI 1049, and southwest of Ithingo Lake (42), SMDI 1081), there has been relatively little exploration devoted to defining commercial iron deposits (>100 Mt) in the region.

## 5. Uranium ± Molybdenum Mineralization

Most uranium showings are hosted by granite pegmatite and calc-silicate rock. Biotite-rich zones are locally fractured, with uraninite/carnotite occurring along fracture planes. In the Cup Lake locality, lenses of radioactive bictite-rich granite pegmatite (SMDI 1028 and 1618) also contain rare earth elements.

Pelitic gneisses typically host concordant to crosscutting granitic segregation pegmatites, which locally contain finely disseminated uraninite and molybdenite. In calc-silicate rocks, uraninite and molybdenite are found as disseminations and are locally concentrated, commonly in association with apatite, in zones of coarse to pegmatitic grain size. One example of this type of occurrence may be stratigraphically linked from SMDI 1964 to SMDI 2009 and possibly SMDI 2007. Uraninite and brannerite occur disseminated in sillimanite-bearing psammitic gneisses north of Karpinka Lake (122). In all these supracrustal rocks, occurrences of uranium are interpreted to be of syngenetic and/or diagenetic (89, 90) origin. Superimposed deformation, metamorphism and/or anatexis have led to their modification.

## 6. Lead Mineralization

A feldspathic quartzite outcropping between Birch and Segment Lakes (SMDI 1054) contains disseminated galena. A grab sample assayed 2.4 percent Pb, 0.08 percent Zn and 13.7 g/t Ag (0.4 oz/ton Ag); however, drilling of the prospect did not intersect significant mineralization. In a shear zone 12 km south of Mawdsley Lake, lead values of less than 450 ppm (SMDI 1963) are associated with pitchblende mineralization assaying 0.196 percent $U_3O_8$.

## 7. Miscellaneous Occurrences of Mineralization

Low grade zinc values were obtained from grab samples and drill core on the northeast shore of George Lake. Assays were less than 0.55 percent Zn (SMDI 1064). At a location 15 km south-southeast of Mawdsley Lake, a sample from a trench in a 1524 m long gossanous ridge returned a value of 2.74 percent Zn (SMDI 1071).

Low values of nickel (less than 2750 ppm Ni) were found at the Rod showing, near Cup Lake (SMDI 1958). The showing comprises two low-grade radioactive (uraninite) pods, which contain graphite, chalcopyrite, pyrite, arsenopyrite and erythrite.

Anomalous concentrations of rare earth elements (REE) and rare metals occur in grab samples at two locations southwest of Cup Lake (SMDI 1618 and SMDI 1028). In the former, a grab sample from a biotite-rich concordant pegmatite assayed 0.36 percent $U_3O_8$, 0.12 percent $Nb_2O_5$ and 0.07 percent $Ta_2O_5$. In the latter, a grab sample from a biotite-rich granite pegmatite cutting diopsidic gneiss assayed 0.06 percent $U_3O_8$, 0.5 percent $Nb_2O_5$ and 0.08 percent $Ta_2O_5$.

A small outcrop of serpentinite at Blackstone Lake contains a maximum of 2 percent asbestos fibre. The maximum fibre length reported was 1.6 cm (SMDI 1047).

## References


1. Ad Astra Minerals Ltd. (1954): Assessment File 74B07-0001.
2. Alcock, F.J. (1935): Mudjatik-Haultain area, Saskatchewan; Geol. Surv. Can., Mem. 180, 16p.
3. Alcock, F.J., Sproule, J.C. and Downie, D.L. (1941a): Geology of Haultain River, Map 579A, Geol. Surv. Can., Scale 1:253,440.
4. _____ (1941b): Porter Lake, northern Saskatchewan; Geol. Surv. Can., Map 580A, with marginal notes, Scale 1:253,440.
5. Black Hawk Mining Ltd. (1969): Assessment File 74B08-0003.
6. Canadian Delhi Oil Ltd. (1970): Assessment File 74A04-0006.
7. Canadian Exploration Ltd. (G. Hall) (1957-1960): Assessment File 74B13-0001.
8. Claude Resources Inc., News Release, Nov. 13, 1987: "Gold Discovery made by Claude Resources, Inc.".
9. _____, News Release, May 18, 1988: "Newmont Mines Ltd. begins major gold exploration at Claude Resources, Ithingo Lake property".
10. _____, News Release, Nov. 21, 1988: "Preliminary drill results at Ithingo Lake, Saskatchewan, confirm gold discovery and show large tonnage potential".
11. Colt Resources Ltd. (1977): Assessment File 74B09-0013.
12. Columbia Geophysics Supplies Ltd. (Pentagon Resources Ltd.) (1980): Assessment File 74B05-0006.
13. Consolidated Ranwick Uranium Mines Ltd. (1954-1955): Assessment File 74B02-0001.
14. Copper Giant Mining Corp. Ltd. (1969): Assessment File 74B02-0007.
15. CPOG-Gunnex (1968): Assessment File 74B14-0001.
16. Cup Lake Uranium Ltd. (1953-1957): Assessment File 74B02-0003.
17. Dahlkamp, F.J. (1978): Geologic appraisal of the Key Lake U-Ni deposits, northern Saskatchewan, Canada; Econ. Geol., v73, p1430-1449.
18. Darling Hydrocarbons Ltd. and Yukon Geothermal Co. Ltd. (1969): Assessment File 74B16-0001.
19. Denison Mines Ltd. (1970): Assessment File 74B08-0009.
20. _____ (1970): Assessment File 74B08-0008.
21. _____ (1970): Assessment File 74B08-0007.
22. _____ (1970): Assessment File 74B01-0006.
23. _____ (1970): Assessment File 74B01-0005.
24. Dynamic Petroleum Products Ltd. (1969): Assessment File 74A13-0004 (geophysics report by J. Klein, Dec. 1969).
25. _____ (1970): Assessment File 74B09-0005.
26. _____ (1969): Assessment File 74A13-0004 (report by R.W. Foster, Feb. 1970).
27. Friesen, P.S. (1953): Field notes on iron deposits in the Spear and Gillies Lakes area; Reconn. from Spear Lake, through Natrillia Lake and south to Gillies Lake, Assessment File 74B12-0004.
28. Frobisher Project (1968): Assessment File 74C09-0002 (full file).
29. Getty Minerals Co. Ltd. (1976): Assessment File 74B09-0006.
30. _____ (1977): Assessment File 74B09-0020.
31. _____ (1977-79): Assessment Files 74A13-0034 and -0035.
32. _____ (1977): Assessment File 74B16-0040.
33. _____ (1978): Assessment File 74B16-0041.
34. _____ (1977-79): Assessment File 74B16-0042.
35. Gilboy, C.F. (1985): Basement geology, part of the Cree Lake (south) area; Sask. Energy Mines, Rep. 203, 47p.
36. Government of Saskatchewan, Dept. of Miner. Resour. and Dept. Mines and Tech. Surveys (1964): Geophys. Pap. 7154G, Mudjatik, Saskatchewan, Sheet 74B; Scale 1:250,000.
37. Great Plains Development Co. of Canada Ltd. (1970): Assessment File 74B02-0010.
38. _____ (1970): Assessment File 74B02-0011.
39. _____ (1970): Assessment File 74B03-0002.
40. _____ (1970): Assessment File 74B03-0001.
41. Harper, C.T. (1974): Northern iron ore exploration, *in* Summary Report of Field Investigations by the Saskatchewan Geological Survey, Sask. Dept. Miner. Resour., p78-83.

42. _____ (1983): Iron ores of northern Saskatchewan; Sask. Energy Mines, Rep. 220, 103p.

43. _____ (1988a): Mudjatik Domain, geology and gold studies: Porter Lake area; *in* Summary of Investigations 1988, Saskatchewan Geological Survey, Sask. Energy Mines, Misc. Rep. 88-4, p49-53.

44. _____ (1988b): Mudjatik Domain, geology and gold studies: Ithingo Lake; *in* Summary of Investigations 1988, Saskatchewan Geological Survey, Sask. Energy Mines, Misc. Rep. 88-4, p42-48.

45. Hillsdon, G.B. (1978): Assessment File 74B12-0003.

46. Hoeve, J. and Sibbald, T.I.I. (1978): On the genesis of Rabbit Lake and other unconformity-type uranium deposits in northern Saskatchewan, Canada; Econ. Geol., v73, no. 8, p1450-1473.

47. Hogg, C.A.L. (1968): Assessment File 74C09-0002 (airborne radiometric spectrometer survey, report dated Jan. 1969).

48. Jenkins, W.S. (1953): Magnetic concentration tests on a sample of iron ore from Spear Lake, Sask.; Mines Branch, Ottawa, No. 23, Report No. 626-D.D.

49. Knox, W.T. (1968): Assessment File 74B14-0003.

50. Lewry, J.F. and Sibbald, T.I.I. (1977): Variation in lithology and tectonometamorphic relationships in the Precambrian basement of northern Saskatchewan; Can. J. Earth Sci., v4, no. 6, p1453-1467.

51. Lewry, J.F., Sibbald, T.I.I. and Rees, C.J. (1978): Metamorphic patterns and their relation to tectonism and plutonism in the Churchill Province in northern Saskatchewan; *in* Metamorphism in the Canadian Shield, Geol. Surv. Can., Pap. 78-10, p139-153.

52. Lewry, J.F. and Sibbald, T.I.I. (1980): Thermotectonic evolution of the Churchill Province in northern Saskatchewan; Tectonophysics, v8, p45-82.

53. Lewry, J.F. and Slimmon, W.L. (1985): Compilation bedrock geology, Lac La Ronge, NTS area 73P/73I; Sask. Energy Mines, Rep. 225 (1:250 000 scale map with marginal notes).

54. Macdonald, R. and Broughton, P. (1980): Geological map of Saskatchewan, provisional edition; Sask. Miner. Resour., 1:1 000 000 scale.

55. Manitou Lake Gold Mines Inc. (1979): Assessment File 74B09-0024.

56. Marline Oil Corporation (1978): Assessment File 74B07-0009.

57. _____ (1979): Assessment File 74B07-0010.

58. Mawdsley, J.B. (1960): Iron ore occurrences, northwestern Saskatchewan; Sask. Dep. Miner. Resour., Rep. 50, 19p.

59. Min-North Engineering Services Ltd. (1976): Assessment File 74B09-0008.

60. Munday, R.J.C. (1972): Mudjatik 74B (SE), Saskatchewan: *in* Summary Report of Geological Investigations conducted in the Precambrian area of Saskatchewan; Sask. Dep. Miner. Resour., p22-25.

61. _____ (1973): Mudjatik 74B (NE), Saskatchewan: *in* Summary Report of Geological Investigations conducted in the Precambrian area of Saskatchewan; Sask. Dep. Miner. Resour., p18-23.

62. _____ (1977): The geology of the Mudjatik (east) area, Saskatchewan; Sask. Dep. Miner. Resour., Rep. 168, 25p.

63. Northern Miner (1988): "Claude Discoveries"; June 20, v74, no. 15, p15.

64. _____, (1988): "Newmont Drilling at Claude's Ithingo"; Sept. 19, v74, no. 28, p20.

65. _____, (1988): "Claude, Newmont pleased with Ithingo drill results"; Nov 28, v74, no. 38, p3.

66. _____, (1989): "Newmont plans more drilling at Ithingo"; Jan. 16, v74, no. 45, p27.

67. Paulger, V. (1975): Assessment File 74B02-0013.

68. Pearson, D.E. (1972): Mudjatik (SW), Saskatchewan; *in* Summary Report of Geological Investigations conducted in the Precambrian area of Saskatchewan, Sask. Dep. Miner. Resour., p30-34.

69. _____ (1977): The geology of the Mudjatik area (southwest quarter), Saskatchewan; Sask. Dep. Miner. Resour., Rep. 166, 31p.

70. Pearson, D.E. and Lewry, J.F. (1974): Large-scale fold interference structures in the Mudjatik River area of northern Saskatchewan; Can. J. Earth Sci., v11, no. 5, p619-634.

71. Pentagon Resources Ltd. (Columbia Geophysical Supplies Ltd.) (1980): Assessment File 74B05-0007.

72. Ramsay, J.G. (1967): Folding and fracturing of rocks; McGraw-Hill Book Co., New York.

73. Ray, G.E. (1975): Foster Lake (NE)-Geikie River (SE) area: Reconnaissance geological mapping of 74A-15(E), -16 and 74H-1 and -2; *in* Summary of Investigations 1975 by the Saskatchewan Geological Survey, Sask. Dep. Miner. Resour., p13-18.

74. _____ (1978): Reconnaissance geology: Wollaston Lake (west) area (part of NTS area 64L); *in* Summary of Investigations 1978, Saskatchewan Geological Survey, Sask. Miner. Resour., Misc. Rep. 78-10, p25-34.

75. Ray, G.E. and Wanless, R.K. (1980): The age and geological history of the Wollaston, Peter Lake and Rottenstone Domains in northern Saskatchewan; Can. J. Earth Sci., v17, no. 3, p333-347.

76. Rees, C.J. (1982): Metamorphism in the Canadian Shield of northern Saskatchewan; Sask. Miner. Resour., Open File Rep. 82-2, 136p.

77. Rice, H.M.A. (1950): Mudjatik-Geikie, Map 1007A; Geol. Surv. Can., scale one inch to eight miles.

78. Roman Corp. Ltd. (1969): Assessment File 74A12-0002.

79. _____ (1969): Assessment File 74B13-0004.

80. Sask. Mining Development Corporation (1976): Assessment File 74B04-0001.

81. Scurry-Rainbow Oil Ltd. (1976-77): Assessment File 74B09-0012.

82. _____ (1979): Assessment File 74B09-0023.

83. _____ (1980): Assessment File 74B09-0025.

84. _____ (1976): Assessment File 74B16-0013.

85. _____ (1976): Assessment File 74B16-0023.

86. _____ (1977): Assessment File 74B16-0024.

87. _____ (1979): Assessment File 74B16-0025.

88. Sibbald, T.I.I. (1973): 74B-NW, Mudjatik (NW); *in* Summary Report of Geological Investigations conducted in the Precambrian area of Saskatchewan; Sask. Dep. Miner. Resour., p35-42.

89. _____ (1975): Investigation of certain radiometric anomalies in Crown Reserve 621; *in* Summary of Investigations 1975, Saskatchewan Geological Survey, Sask. Dep. Miner. Resour., p123-129.

90. Sibbald, T.I.I., Munday, R.J.C. and Lewry, J.F. (1977): The geological setting of uranium mineralization in northern Saskatchewan; *in* Dunn, C.E. (ed.), Uranium in Saskatchewan, Sask. Geol. Soc., Spec. Publ. No. 3, p51-98.

91. Silver Chief Minerals Ltd. (1969): Assessment File 74B13-0003.

92. Skogie Mines Ltd. (1967): Assessment File 74B05-0003.

93. Slimmon, W.L., Sibbald, T.I.I. and Thomas, M.W. (1988): Compilation bedrock geology, Mudjatik, NTS area 74B; Sask. Energy Mines, Rep. 244 (1:250 000 scale map with marginal notes).

94. Sproule, J.C. (1938): Mudjatik area, Saskatchewan; Geol. Surv. Can., Map. 38-8 (with marginal notes), 13p.

95. Sunlite Oil Co. Ltd. (1969): Assessment File 74B02-0005.

96. _____ (1975): Assessment File 74B06-0022.

97. _____ (1973): Assessment File 74B06-0012.

98. _____ (1969-70): Assessment File 74B06-0004.

99. _____ (1969-70): Assessment File 74B06-0006.

100. _____ (1973-74): Assessment File 74B06-0019.

101. _____ (1973-74): Assessment File 74B06-0020.

102. _____ (1975): Assessment File 74B06-0025.

103. _____ (1968): Assessment File 74B06-0005.

104. _____ (1973-74): Assessment File 74B06-0018.

105. _____ (1975-76): Assessment File 74B06-0023.

106. _____ (1973-74): Assessment File 74B06-0016.

107. _____ (1973-74): Assessment File 74B06-0017.

108. _____ (1973): Assessment File 74B06-0013.

109. _____ (1975): Assessment File 74B06-0024.

110. _____ (1974): Assessment File 74B06-0027.

111. _____ (1973): Assessment File 74B06-0011.

112. _____ (1973-74): Assessment File 74B06-0015.

113. _____ (1975): Assessment File 74B06-0021.

114. _____ (1972-73): Assessment File 74B06-0014.

115. Nova Uranium Mines Ltd. (1955): Assessment File 74B06-0001.

116. Swenson, C. (1969): Assessment File 74B02-0004.

117. Syme, A. (1955): Assessment File 74B05-0001.

118. Thomas, D.J. (1983): Distribution, geological controls and genesis of uraniferous pegmatites in the Cree Lake Zone of northern Saskatchewan; Unpubl. M.Sc. thesis, Univ. Regina, Saskatchewan, 212p.

119. Wallis, R.H. (1970): A geological interpretation of gravity and magnetic data, northwest Saskatchewan; Can. J. Earth Sci., v7, no. 3, p858-868.

120. Western Miner and Oil Review (Nov. 1954).

121. Western Mines Ltd. (1976): Assessment File 74B02-0014.

122. Williams-Jones, A.E. and Sawiuk, M.J. (1985): The Karpinka Lake uranium prospect, Saskatchewan: a possible metamorphosed Middle Precambrian sandstone-type uranium deposit; Econ. Geol., v80, no. 7, p1927-1941.

# Mineral Occurrences

The abbreviations of mineral names used in this table are those standardized by the Geological Survey of Canada, with additions where necessary.

ala - allanite
ap - apatite
asb - asbestos
asp - arsenopyrite
br - brannerite
car - carnotite
cp - chalcopyrite
ery - erythrite
fl - fluorite
gf - graphite
gn - galena
gum - gummite
hem - hematite
hyp - hypersthene
mag - magnetite
mal - malachite
mo - molybdenite
pch - pitchblende
py - pyrite
po - pyrrhotite
qtz - quartz (stringers)
REE - rare earth elements
sp - sphalerite
ur - uraninite
uph - uranophane
u - unidentified uranium minerals

**Mineral Occurrences Identified in SMDI File**

| *SMDI No.* | *Elements Present* | *Name of Occurrence/ General Location* | *NTS 74B* | *Minerals Present* | *Host Rock/ Structure and Remarks* | *Reference Numbers* |
|---|---|---|---|---|---|---|
| 1024a | Cu | 3 km north of north-central part of Flinthead Lake | 2 | cp | calc-silicate gneiss and marble interlain with biotite-rich gneiss and meta-arkose | 60, 61, 62 |
| 1024b | Cu | 0.4 km north of north-central part of Flinthead Lake | 2 | cp | calc-silicate gneiss and marble interlain with biotite-rich gneiss and meta-arkose | 60, 61, 62 |
| 1025 | Mo (Th, U) | 1 km south of Schmitz Lake (east of Keller Lake) | 2 | mo, u | radioactivity is associated with K-feldspar-rich pegmatite, and porphyry dykes which are albite- and biotite-rich; minor mo occurs in quartz veins on migmatite-arkose contact | 14, 60, 61, 62 |
| 1026 | Fe (U) | 2.3 km west of Haultain River, 1.3 km northeast of Cup Lake | 2 | py, po | large folded band of hornblende gneiss, granulite | 60, 62 |
| 1027 | Fe | southeast shore, Keller Lake | 2 | py | north-trending band of biotite-rich gneiss | 60, 62 |
| 1028 | REE, U, Nb, Ta, Th, Mo | 8 km south-southwest of the southwest end of Cup Lake | 2 | ur, mo, fl, ala, u, not identified | lenses of radioactive pegmatite conform to enclosing northerly-trending gneiss | 60, 61, 62, 95 |
| 1029 | U (Th) | 2 km east of east end of Airway Lake | 2 | not identified | radioactive pegmatite and biotite granite gneiss | 37, 38, 40, 60, 61, 62, 69 |
| 1030 | U (Th, Mo) | 1 km east of central part of Wise Lake | 2 | py, mo, gum | minor py and mo in pegmatite; gummite in gneissic granite; trench assays were 0.14%, 0.12% and 0.36% $U_3O_8$. U mineralization is controlled by 035°-trending vertical dipping fracture, which registered counts of 8000-10,000 cps. | 37, 38, 60, 61, 62, 69 |

| SMDI No. | Elements Present | Name of Occurrence/ General Location | NTS 74B | Minerals Present | Host Rock/ Structure and Remarks | Reference Numbers |
|---|---|---|---|---|---|---|
| 1031 | U (Ni, Cu, Mo, Y, Th) | northwest shore, Cup Lake | 2 | ur, mo, uph, fl | calc-silicate gneiss, pegmatitic biotite gneiss southeast of granite/metasediment contact, and in outliers to the north in granitic gneisses | 16, 40, 62, 67, 95, 116 |
| 1032 | U (Mo, Fe) | north of Cup Lake, at Key Lake | 2 | ur, mo, py, po, uph | radioactivity is restricted to pegmatite with uph; ur and minor mo occur sporadically on the northwest shore of Cup Lake near the granite/sediment contact | 13, 60, 61, 62 |
| 1033 | U (Fe, Mo) | 8 km west of Studer Lake | 3 | ur, py, mo | red pegmatite with ur cuts gneissic granite; minor py and mo | 40, 69 |
| 1034 | U | eastern-most bay in Upson Lake | 3 | ur | radioactive biotitic shear zone in pegmatite dyke, intruding biotite gneiss | 40, 69 |
| 1035 | U (Fe, Mo) | 1.8 km west of west shore of main island in Upson Lake (on shore of small lake) | 3 | uph, py, mo | red pegmatite (with py and mo) intrudes migmatites and quartz-rich iron formation; uph is along fractures and shears in pegmatite | 39, 40, 69 |
| 1036 | U (C, Fe) | near west shore, Soaring Lake | 3 | ur, uph, gf, py | medium-grained garnetiferous granite gneiss; uph staining is associated with fractures, and inclusions of uraninite | 39, 40, 69 |
| 1037 | Fe | Gillies Lake | 5 | py, po, mag | po and py in mafic gneisses; mag and po are locally abundant in banded iron formation<br>Assay = 42% Fe | 58, 69 |
| 1038 | Fe | Frobisher Lake, south shore | 5 | mag | concordant with mafic gneiss<br>Assay = 43% Fe over narrow widths | 58, 69, 93, 120 |
| 1039 | Fe | 3.2 km southeast of Natrillia Lake | 5 | mag | lean iron formation: regular banding of (1) quartz plus minor magnetite and (2) magnetite with olivine and actinolite extending to Grand Rapids on Mudjatik River | 58, 69, 88 |
| 1040 | U | 14 km east of northeast bay of Frobisher Lake | 5 | car | blobs in granite and pegmatite indicating surface leaching | 12, 28, 69, 71, 80, 92, 117 |
| 1041 | Ag (Cu, Ni, Zn, Au) | 3 km southeast of the eastern bay, Blackstone Lake | 6 | cp, po | thin band of weakly mineralized northwest-trending gossaned metavolcanic | 69 |
| 1042 | Ag (Au, Cu) | northeast of east end of Centipede Lake | 6 | po, py, cp, Cu, mo | local mo and native Cu; trenching on sulphide-rich conductors gave assays of 1.36 to 16.5 g/t Ag and 0.34 to 0.68 g/t Au | 69, 96, 97, 98, 106 |

| SMDI No. | Elements Present | Name of Occurrence/ General Location | NTS 74B | Minerals Present | Host Rock/ Structure and Remarks | Reference Numbers |
|---|---|---|---|---|---|---|
| 1043 | Au (Ag, Cu, Ni, Co, As) | metasedimentary band extends 3 km northeast from northwest bay of 'Three Phase Lake' | 6 | po, py, cp, asp, Cu | sulphide-arsenide vein cutting hornblende pyroxene granulite; local native Cu; trench samples assay trace to 9.2 g/t Au | 69, 98, 104, 105 |
| 1044 | Cu (Pb, Zn, Ni, Fe, Au) | near west shore, Porter Lake | 6 | po, mag, py, cp, Cu | gossans on coarse-grained quartzite with biotite and hornblende; Cu values in TR-8/75 (102), assay 0.34, 0.68, 1.02 and 1.37 g/t Au (Cu assayed up to 0.24%) | 69, 96, 98, 99, 100, 101, 102 |
| 1045 | Cu (Au, Ag, Zn, Ni) | northeast bay of Segment Lake | 6 | Cu, cp | gossaned iron formation (hornblende-garnet quartzite); mafic intrusions with disseminated sulphides; local native Cu; trench assays gave 0.02 to 0.07% Cu, 0.34 to 0.02 g/t Au | 69, 98, 99, 100, 111, 112, 113 |
| 1046 | Cu (Fe, Ni) | on island, Fuller Lake | 6 | po, cp, py | basic metavolcanic and intrusives surrounded by granite gneiss | 2, 69, 98, 103 |
| 1047 | Cu (Fe, Mg) | southwest bay, Blackstone Lake | 6 | py, po, asb, mag, cp | amphibolite is host to py, po and cp; asbestos in serpentinite (1.59 cm fibre length) | 2, 69, 98, 103 |
| 1048 | Cu (Ni, Zn, Mo, Au, U) | east bay, Porter Lake | 6 | cp, mag, po, mo, car | minor cp occurs in all rock types; radioactivity in pegmatite, found mainly in garnets | 69, 98, 99, 100, 107, 108, 109 |
| 1049 | Fe (Cu) | southwest of Dot Lake | 6 | mag, py, po, cp | iron formations: banded quartz-magnetite rocks and pyrite-pyrrhotite bearing quartzites, interlayered with hornblende gneisses | 69, 103, 104, 106 |
| 1050 | Fe (C, Cu) | Porter Lake, east shore | 6 | mag, gf, cp, po, mal | iron formation with basic metavolcanics, quartzitic metasedimentary gneiss and pelite, surrounded by granitic gneiss, intruded by ultramafic rocks | 69, 108, 109, 110 |
| 1051 | Fe | between Segment Lake and 'Three Phase Lake' | 6 | py | banded iron formation, in 0.4 km wide band of east-northeast-trending quartzitic metasediments and possible basic volcanics | 69, 98, 111, 112, 113 |
| 1052 | Fe | 4.5 km west of lower Porter Lake | 6 | mag, py | banded iron formation: in banded metasediments and metavolcanics | 58, 69, 114 |
| 1053 | Fe | 2.5 km east of northeast bay of Blackstone Lake | 6 | mag | banded iron formation, with thin magnetite bands | 69, 103 |
| 1054 | Pb (Cu, Zn) | between Birch Lake and Segment Lake | 6 | gn, po, py, gf | feldspathic quartzite | 69 |

| SMDI No. | Elements Present | Name of Occurrence/ General Location | NTS 74B | Minerals Present | Host Rock/ Structure and Remarks | Reference Numbers |
|---|---|---|---|---|---|---|
| 1055 | U (Th, Cu, Ag, Ni) | north end, Porter Lake | 6 | car | car in granitic pegmatite, associated with biotitic granite gneiss in migmatite complex | 68, 98, 99 |
| 1056 | U (Fe, C) | northwest bay, Blackstone Lake | 6 | ur, py, po | metasediments, cut by narrow bands of pegmatite and gneiss containing uraninite crystals | 69, 98, 115 |
| 1057 | U (Fe, Th) | 4 km west of Porter Lake | 6 | car, mag, pch? | car (and pch?) associated with up to 40% magnetite in pegmatite | 69, 100 |
| 1058 | Cu | 0.8 km west of north end of Peak Lake | 7 | cp | sulphide-bearing psammite within felsic gneiss dome | 60, 62 |
| 1059 | Cu (Zn, Mo, Ni) | 2.5 km east of 'Blob Lake'; 5 km southeast of east bay of Vedette Lake | 7 | cp, py, po | metasedimentary gneisses | 60, 62, 95 |
| 1060 | U | near Upper Peak Lake | 7 | u, not identified | small radiometrically anomalous granitic pegmatite dykes intrude pelitic and psammitic metasediments; assay values less than 0.09% U | 1, 60, 62 |
| 1061 | Fe | 10 km east of east bay of Vedette Lake | 7 | py | meta-arkose containing quartz-sillimanite knots; py in disseminations and veinlets | 60, 62 |
| 1062 | Fe | 3.7 km west of the north end of Complex Lake | 7 | py | northeast-trending biotitic gneiss | 60, 62 |
| 1063 | Fe | 17 km east of east end of Orphan Lake | 8 | po | in biotite gneiss | 60, 62 |
| 1064 | Zn (Fe, C, U) | northeast bay, George Lake | 8 | sp, car, gf, py, po | sp veinlets in quartzose and calcareous biotite gneiss, local py, po, gf, and car; assay of 0.53% Zn over 0.3 m | 5, 6, 19, 20, 21, 22, 23, 26, 60, 62, 78 |
| 1065 | Cu (Fe, C) | 9 km southwest of Mawdsley Lake | 9 | py, gf, cp | EM, SP conductor and radiometric anomaly; hornblende-biotite paragneiss up to 10% py, 10% gf; assay less than 0.1% Cu | 24, 25, 61, 62 |
| 1066 | Fe | 9.7 km east-southeast of Smalley Lake | 9 | py | in northeast-trending quartzitic metasediment | 56, 57, 61, 62, 69 |
| 1067 | Fe | 11 km northeast of Smalley Lake | 9 | py | in quartzitic metasediments | 62 |
| 1068 | Fe | 14.5 km northeast of Smalley Lake | 9 | py | in quartzitic metasediments | 62 |

| SMDI No. | Elements Present | Name of Occurrence/ General Location | NTS 74B | Minerals Present | Host Rock/ Structure and Remarks | Reference Numbers |
|---|---|---|---|---|---|---|
| 1069 | U | 8.7 km southeast of Smalley Lake | 9 | car | car bloom on meta-arkose; one outcrop contains tourmaline-rich quartzose pod 0.2 m in diameter | 61, 62 |
| 1070 | U | 10 km east-southeast of Smalley Lake | 9 | car | car bloom on meta-arkose; one outcrop is close to a calc-silicate bed | 61, 62 |
| 1071 | Zn (Cu, Ni, Mo, C) | 7 km east-southeast of Smalley Lake | 9 | gf, po, py | amphibolite with traces of Cu, Ni and Mo, and one value of 2.74% Zn; a 1524 m long anomaly outcrops as a gossaned ridge | 24, 25, 61 |
| 1072 | Fe | 3 km west of Boffa Lake | 10 | po | mafic amphibolite in synform; po is disseminated through 3 m of amphibolite | 61 |
| 1073 | Fe | 10 km north of Boffa Lake | 10 | mag | iron formation, in very narrow bands | 61 |
| 1074 | Fe | 10 km south of Little Grand Rapids | 11 | mag | iron formation: alternating bands, rich in magnetite and silicate | 88 |
| 1075 | Fe | 2.5 km south of Grand Rapids | 11 | mag | 3 magnetic anomalies; impure lean iron formation: quartzitic bands interlayered with narrow magnetite-rich bands; sections up to 35% magnetite | 58, 88 |
| 1076 | Fe (U, P) | 2.2 km north of Grand Rapids | 11 | mag, hyp, ap | iron formation: quartzitic and mag-rich bands; minor hyp and ap; less than 0.001% U | 47, 58, 88 |
| 1077 | Fe | 2 km southeast of east bay of Spear Lake | 12 | mag | iron formation: magnetite-bearing bands, with quartzite, hornblende gneiss, garnet-hornblende gneiss; mag is associated with calcareous? calc-silicate? | 27, 48, 58, 88 |
| 1078 | Fe | 5.8 km southwest of southwest bay of Vermilion Lake | 12 | mag, py, po | iron formation: within basinal fold, with banding of mag and quartz-rich layers; py and po locally | 88 |
| 1079 | Ag (As) | 2.4 km south-southwest of Ithingo Lake | 13 | py, asp, qtz | quartzite with disseminated crystals of py and asp, which probably are host to Ag; best (chip) assay; 0.83 g/t Ag over 45.7 m | 7, 15, 41, 58, 77, 88, 91 |
| 1080 | Cu (As, Zn, Fe, Au) | on peninsula separating east and west arms of Ithingo Lake | 13 | qtz, cp, py, asp, mag, po, sp, traces of Au | several small sulphide deposits, a 30.5 m width of paragneiss is silicified and cut by quartz veins and stringers parallel to schistosity; local bands of gneiss up to 0.3 m in thickness are almost completely replaced by sulphides | 2, 77, 88, 94 |

| SMDI No. | Elements Present | Name of Occurrence/ General Location | NTS 74B | Minerals Present | Host Rock/ Structure and Remarks | Reference Numbers |
|---|---|---|---|---|---|---|
| 1081 | Fe (Ag, Au) | 1.6 km southwest of Ithingo Lake | 13 | qtz, mag, py, po | iron formation: quartz-rich and thin magnetite-rich layers | 7, 15, 41, 58, 88, 91, 94 |
| 1082 | Fe | 1.6 km southeast of Ithingo Lake | 13 | mag, po | low grade iron formation, which follows granite-metasediment contact | 15, 41, 58, 88, 94 |
| 1083 | Fe | along west shore of the point on Ithingo Lake | 13 | mag, py | iron formation: magnetite-rich and quartz-rich layers; magnetite and quartz veining | 15, 41, 58, 88, 94 |
| 1084 | U | 2.3 km north-northwest of Roe Lake | 13 | car | metasediments with car bloom in granitic gneiss; local schlieren | 15, 79, 88, 91 |
| 1085 | Ag (U, Fe, As, Au) | near the southwest bay, Vermilion Lake | 14 | py, asp, car, sp | radioactive metasediment band parallel to a heavily mineralized sulphide zone; pegmatite cutting granite contains car and coarse biotite (scintillometer counts were up to 15 times background) | 15, 47, 49, 91 |
| 1086 | Fe | on west shore of Desnomie Lakes | 15 | mag, py | iron formation in north-northeast trending amphibolites | 61, 62 |
| 1087 | Fe | 2.4 km east of Jacobsen Lake | 15 | mag, py | amphibolitic iron formation in a northeast-plunging synform | 61, 62 |
| 1088 | Fe | 12 km east of Jacobsen Lake | 15 | mag, py | amphibolitic iron formation in a northeast-plunging synform | 61, 62 |
| 1089 | Fe | 13 km northeast of Haultain Lake | 16 | py | disseminated in northeast-trending quartzitic metasediments | 61, 62 |
| 1090 | Fe | 20.5 km northeast of Haultain Lake | 16 | py | disseminated in northeast-trending quartzitic metasediments | 61, 62 |
| 1618 | REE (Nb, Ta, U) | 0.4 km south of Cup Lake | 2 | ur, mo, ala | small biotite-rich pegmatite dykes cutting diopsidic gneiss; pegmatite grab sample assayed 0.36% $U_3O_8$, 0.12% $Nb_2O_5$ and 0.07% $Ta_2O5$ | 60, 61, 62, 95, 118 |
| 1930 | U (Fe, C, Cu) | Cup Lake, 'George' showing | 2 | pch, py, gf, po, cp | pch pod within oxidized pyritic quartzose layer in diopsidic calc-silicate rock; radioactive frost-heaved gossaned calc-silicate boulders | 16, 60, 61, 62, 95, 116, 118, 121 |
| 1958 | Ni (Co, U, C, As, Ag, Cu, Fe, Mo) | Cup Lake, 'Rod' showing | 2 | ery, cp, asp, gf, pch, mo | interfingered calc-silicate, marble, pelitic metasediments; two low-grade pitchblende pods of complex mineralogy, conformable with foliation pinching out at north and south ends; one sample assayed 0.275% Ni | 16, 62, 95, 116, 118 121 |
| 1959 | U (C, Fe, Mo) | Cup Lake, 'Simon' Showing | 2 | pch, py, mo, po, gf | mineralized veins cross-cut small layers of calc-silicate rocks and quartzite in biotite-feldspar gneiss | 16, 60, 61, 62, 95, 116, 118, 121 |

| SMDI No. | Elements Present | Name of Occurrence/ General Location | NTS 74B | Minerals Present | Host Rock/ Structure and Remarks | Reference Numbers |
|---|---|---|---|---|---|---|
| 1960 | U | 5.5 km southeast of Mawdsley Lake 'Sandra Lake' occurrence | 9 | car, ur | car bloom on meta-arkose; assays up to 0.26% U; car replaces ur associated with biotite, actinolite and hem | 24, 25, 59, 62 |
| 1961 | U (Mo, Th) | 6.6 km north-northwest of Mawdsley Lake | 16 | car, mo, u | single drill hole M-1, within the 'E' zone, containing secondary uranium minerals, returned best intersection: 0.1092% U; the uranium mineralization occurs in the calc-silicate zone in the pyroxene-rich unit; metasediments are cut by coarse-grained calcareous pegmatites enriched in U, Th, and Mo | 25, 62, 81, 84, 85, 86, 87 |
| 1962 | U | 5.5 km west-southwest of south end of Brûlé Lake Granite | 9 | car, ur | slight car in granitic pegmatite and felsic gneiss; car and ur in fractured zones up to 0.06% U | 29, 62 |
| 1963 | U | 13 km east of Smalley Lake | 9 | car, pch | weathered boulder, containing massive pch resting on sheared calc-silicate: shear zone contains sooty pch and orange and yellow car, and trends 045°; samples from shear returned up to 0.166% U with low lead values | 29, 30, 55, 62 |
| 1964 | U | 17 km east of Smalley Lake | 9 | car | car stained very coarse phlogopite books; diopside and scapolite are present; car is sporadic and generally occurs in coarse-grained calc-silicate | 29, 30, 62 |
| 1965 | U | 5.5 km east of east end of Vedette Lake | 7 | u, not identified | siliceous schists within calc-silicate; grade less than 0.075% U | 56, 57, 60, 62, 69, 95 |
| 1966 | U | 5 km east-northeast of north end of Heddery Lake | 12 | u | granitic pegmatite (6 to 20 m wide, 120 m long) assay up to 0.0985% U over 1.5 m | 62 |
| 1974 | U | Karpinka Lake showing or 'George' showing | 16 | ur, br, py, po, cp, Ti-mag | host gneiss is sillimanitic arkose; local br coarser than ur, is enveloped by sulphides; background U mineralization is less than 1 ppm in meta-arkose; best core mineralization was 4300 ppm (0.43%) $U_3O_8$ over 0.5 m | 31, 32, 33, 34, 61, 122 |
| 1982 | U | 8.5 km east-northeast of eastern Haultain Lake; 'A' Zone | 16 | u | within calc-silicate rocks interbanded with north-striking gneiss; the zone is radioactive with U mineralization along biotite-filled fractures | 18, 62, 84, 85, 86, 87 |

| SMDI No. | Elements Present | Name of Occurrence/ General Location | NTS 74B | Minerals Present | Host Rock/ Structure and Remarks | Reference Numbers |
|---|---|---|---|---|---|---|
| 1983 | U (Mo) | 8 km north-northwest of Mawdsley Lake; 'C', 'D', 'E' zones | 16 | u, mag, mo | 'C' zone quartzites and local calc-silicates contain disseminated uranium and molybdenum mineralization; 'D' zone occurs within quartzites, and contains slight uranium and molybdenum mineralization; 'E' zone calc-silicate intruded by pegmatite returned values less than 0.54% U in grab samples from trenches | 24, 25, 62, 84, 85 |
| 1984 | U (Fe, C, Mo) | 7 km north-northwest of Mawdsley Lake | 16 | car, mag, gf, mo | yellow car, associated with biotite and some molybdenite in calc-silicate gneiss; radiometric highs of 10,000 cps. | 18, 62, 84, 85, 86, 87 |
| 1985 | U (Mo, Cu, Fe) | 8.5 km east-northeast of Smalley Lake | 9 | mo, po, py, cp, u | maximum assays: 0.18% U, 0.4% $MoS_2$ and 0.6% Cu | 11, 24, 62, 81, 82, 83, 84, 85, 86, 87 |
| 2007 | U | 15 km south-southeast of Smalley Lake | 9 | car, ur | weak car stain and ur disseminated in granitic pegmatite, felsic gneiss and in fractured zones; fractured calc-silicate assayed 0.358% U (Zone 1-2) | 29, 62 |
| 2008 | U | 16.5 km south-southeast of Smalley Lake | 9 | car, ur | car stain in granitic pegmatite and felsic gneiss; stain and ur in fractured zones in calcareous meta-arkose; assay for zones 1-3, 0.229 % U. | 29, 62 |
| 2009 | U | 4 km north of south end of Brûlé Lake Granite | 9 | car, ur | traces car in pegmatite and felsic gneiss; car and coarsely crystalline ur in fracture zones; zone 2-3 calcareous peg with coarse crystals of ur in fractures; assay 3.90% U | 29, 62 |
| 2010 | U | 5.5 km north of south end of Brûlé Lake Granite | 9 | car, ur | Zone 2-6 assay, 2.36% U; north-eastern and northwesterly fractures, sporadic uraninite | 29, 62 |
| 2011 | U | 5 km north of south end of Brûlé Lake Granite | 9 | car, ur | zone 2-7 assay 0.118% U, from brecciated pegmatite | 29, 62 |
| 2074 | Au (Fe, Cu, As) | near southeast shore, east arm, Ithingo Lake | 13 | Au (in qtz shears) py, po, cp, asp | gold is hosted in east-trending steeply north-dipping foliation parallel quartz-filled shears in amphibolite gneiss along south rim of east arm, Ithingo Lake; the main gold zone, in a silicate facies iron formation, is 1490 m long, with widths up to 6.1 m; trench samples returned assays of 0.18 oz/ton Au (6.18 g/t) over 12 ft. (3.7 m), and 0.12 oz/ton Au (4.1 g/t) over 19 ft. (5.8 m) | 8, 9, 10, 41, 42, 44, 58, 63, 64, 65, 66, 91, 94 |

MAPS
NOT
FILMED

CARTES
OMISES